

# PHONEMIC SYSTEM OF TUCANO

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The Tucano language is of special interest from a sociolinguistic standpoint, as the trade language of the multilingual Vaupés area. The interaction of the various Tucanoan languages spoken in the Vaupés merits a separate study of its own, to ascertain what, if any, has been the amount and direction of borrowing.

A special feature of Tucano (and Tucanoan) is the complementary distribution of certain oral consonants and their nasal counterparts, conditioned by occurrence next to oral or nasalized vowels.

A further feature of Tucano is the suprasegmental system, here presented in bare outline. The patterns of multiple stress, with crescendo and decrescendo, and the patterns of pitch and pitch perturbation should be presented in a separate article when they have been analyzed more fully.

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1. Introduction. Tucano is a member of the Eastern Tucanoan language family and is spoken along the Papurí River and its tributaries, extending into Brazil. The estimated number of living Tucanos in Colombia is 1500. The following paper is based on data gathered in Acaricuara, located on the Paca River, between July, 1963, and November, 1964, and represents the Acaricuara dialect. Various vowel changes have been observed in the downriver dialect which are not handled in this paper.

The principal informants used are: Berta Cordero, 20 years of age, Teodora Forero, 25 years of age, Nasaria Cordero, 55 years of age, Porfirio Neira, 24 years of age, Joaquina Chagres, 19 years of age, Lucina Gonzales, 16 years of age, Aracelia Neira, 15 years of age, Cándido Chagres, 14 years of age. All are bilingual in Spanish to varying degrees. Berta Cordero has the most fluent knowledge of Spanish.

A special characteristic of the Vaupés area is the multilinguality of its inhabitants. According to tribal custom, a member of one tribe must marry a member of a different tribe. This is especially true of tribes on the Papurí River and its tributaries.

All of the above informants are Tucanos, because their fathers are Tucanos. Their mothers are from four different tribes. Three have Desano mothers, two have Tuyuca mothers, one has a Siriano mother, and one has a Tariano mother.

Because of this situation all speakers of Eastern Tucanoan languages are familiar with more than one language of the family. Tucano is the trade language on the Papurí and tributaries; thus other inhabitants of that area are bilingual

in Tucano and may speak or understand several other languages as well.

2. Phoneme chart.

	Consonants				
	Bilabial	Alveolar	Palatal	Velar	Glottal
Voiceless stops	p	t		k	ʔ
Voiced stops	b	d		g	
Spirants		s			h
Flap		r			
Semivowels	w		y		

	Vowels			Suprasegmental
	Front	Central	Back	
High	i	ɨ	u	Stress /' /
Low	e	a	o	Pitch /'˘˘˘ /
				Nasalization /Ṽ /

3. Consonants. There are eighteen segmental phonemes: twelve consonants and six vowels. The consonants consist of two series of stops, voiceless p t k ʔ and voiced b d g; spirants s h; semivowels w y; and a flap r.

Members of the voiceless stop series are bilabial, alveolar, velar, and glottal. Examples of initial and medial occurrence are as follows: pùʔtí 'mass of the bitter manioc', ʔòpé 'pitch', tùʔtíbi 'he scolds', ʔotéʔè 'I plant (seeds)', kùtírò 'chest', ʔàké 'monkey', ʔutíá 'wild honeybee', ʔòʔéʔè 'I grate bitter manioc'.

The voiced stops are bilabial, alveolar, and velar. Medially voiced stops tend to fortis articulation. The velar stop occurs only medially. bú 'guara (jungle rodent)',

bùʔbéʔè 'I plant by sticking in the ground', dí 'blood', wádàrì 'veins', págà 'stomach'.

The spirants are alveolar and glottal. The glottal spirant /h/ occurs only breath group medially. sẹ̀rǎ 'pine-apples', ʔòsò 'bat', ʔòhó 'banana'.

The semivowels are produced at the labial and alveopalatal points of articulation: wàʔí 'fish', pòéwà 'rapids', yáí 'jaguar', díáyì 'dog'.

The flap is alveolar and occurs breath group medially as shown in the following example: dīērí 'eggs'.

3.1. Contrasts. Consonant phonemes are in contrast in analogous environments:

p/b/w	pìʔí 'loosely woven basket', bìʔí 'mouse', wìʔí 'house'.
t/d/r	tá 'grass', dàsé 'toucan', pátù 'coca, a narcotic', pèrù 'native beer', dǎʔpódíà 'heel', sàʔpórì 'foam', bùʔárò 'down-hill trail', bùʔédà 'rainbow'.
k/g	ètákà 'the one who arrived', ètágì 'the one who is arriving'.
s/h/ʔ	bàsá 'people', bàhà 'macaw', bàʔá 'trail'.

3.2. Variants. Voiceless stops have varying degrees of aspiration according to speaker or utterance. Aspiration is more pronounced preceding /u/ and /i/. púrì [p<sup>h</sup>ũrì<sup>h</sup> ~ pũrì<sup>h</sup>] 'leaf', wǎipí [wǎip<sup>h</sup>í<sup>h</sup> ~ wǎipí<sup>h</sup>] 'airplane', tǔrǔpí [t<sup>h</sup>ũrǔpí<sup>h</sup> ~ tũrǔpí<sup>h</sup>] 'car', pátù [p<sup>h</sup>áthù<sup>h</sup> ~ pátù<sup>h</sup>] 'coca, a narcotic', kǐ [k<sup>h</sup>í<sup>h</sup> ~ kǐ<sup>h</sup>] 'he', kǎrèʔkè [k<sup>h</sup>ǎñèʔkè<sup>h</sup> ~ kǎñèʔkè<sup>h</sup>] 'chicken'.

Pre-nasalized variants of the voiced stops occur breath group initially and following nasalized vowels medially. Since the voiced velar stop /g/ does not occur phonemic word initially there has been no occurrence of [ŋg] in this position. bèʔró [m̃bèʔró<sup>h</sup>] 'later', ʔúbàʔà [ʔú<sup>m̃</sup>bàʔà<sup>h</sup>] 'I don't know', dèʔró [ndèʔró<sup>h</sup>] 'what', Bǎdú [m̃ǎ<sup>h</sup>dú<sup>h</sup>]

'Manuel, a name', ʔágārà [ʔáŋgālā<sup>h</sup>] 'Los Angeles, a village'.

All voiceless stops have pre-nasalized variants following a syllable which has voiceless consonant onset, nasalized vowel, and high pitch. kópè [kó<sup>m</sup>pè<sup>h</sup>] 'left', wàkútì [wàhkúntì<sup>h</sup>] 'remember?', wèhéká [wèhéká<sup>h</sup>] 'fish net'.

All voiced consonants have nasal variants at the same points of articulation. The voiced bilabial nasal [m] is a variant of the voiced bilabial stop /b/, the voiced alveolar nasal [n] is a variant of the voiced alveolar stop /d/, the voiced velar nasal [ŋ] is a variant of the voiced velar stop /g/, the voiced alveolar nasal flap [ñ] is a variant of the voiced alveolar flap /r/, the voiced bilabial nasalized semivowel [w̃] is a variant of the voiced bilabial semivowel /w/, the alveo-palatal nasalized semivowel [ỹ] is a variant of the alveo-palatal semivowel /y/. The nasal variants occur preceding nasalized vowels whereas the oral variants occur preceding oral vowels. bàʔápì [mbàʔápì<sup>h</sup>] 'I ate', bàʔápì [màʔápì<sup>h</sup>] 'on the trail'; díápì [ndiápì<sup>h</sup>] 'at the river', díápì [niápì<sup>h</sup>] 'I was', págà [págà<sup>h</sup>] 'stomach', púgì [púgì<sup>h</sup>] 'hammock'; sèré [sèřéh] 'a skin disease', sèrá [sèñá<sup>h</sup>] 'pineapple'; wèrè'ábì [wèrè'ámì<sup>h</sup>] 'he told', wèrì'ábì [wèñì'ámì<sup>h</sup>] 'he died'; yúkà [yùhká<sup>h</sup>] 'vulture', yòkà [yòhká<sup>h</sup>] 'a drink made from bitter manioc'.

The voiced bilabial semivowel /w/ has freely fluctuating variants ranging from no friction to light friction preceding mid vowels with slightly heavier friction preceding front vowels: wìʔí [bìʔí<sup>h</sup> ~ wìʔí<sup>h</sup>] 'house', wètá [bèhtá<sup>h</sup> ~ wèhtá<sup>h</sup>] 'tapioca', wèpá [bèpá<sup>h</sup> ~ wèpá<sup>h</sup>] 'airplane', pòewà [pòéwà<sup>h</sup> ~ pòewà<sup>h</sup>] 'rapids'. A nasalized variant occurs before nasalized vowels: wéó [wéó<sup>h</sup>] 'panpipe flutes', wàtí [wàhtí<sup>h</sup>] 'devil'.

The voiced alveopalatal semivowel /y/ has freely fluctuating variants ranging from no friction to slight friction to a semivowel with stopped onset: yàʔí [dyaʔí<sup>h</sup> ~ yàʔí<sup>h</sup>] 'I',

díáyì [ndiádyì<sup>h</sup> ~ diáyì<sup>h</sup>] 'dog', yèsé [dyèhsé<sup>h</sup> ~ yèhsé<sup>h</sup>] 'pig'.

The voiced alveolar flap /r/ has three variants, voiced alveolar lateral flap, voiced alveolar nasal flap, and the voiced alveolar flap. The lateral flap [l̥] occurs only following mid and back oral vowels: pòàrì [pòáí<sup>h</sup>] 'hair', sīrīá [sīlíá<sup>h</sup>] 'Siriano, an Indian tribe', ʔùùró [ʔùúló<sup>h</sup>] 'word', kórè [kóí<sup>h</sup>] 'to her'.

The nasal flap [ɲ] occurs between nasalized vowels:<sup>1</sup> púrì [pūí<sup>h</sup>] 'leaf', sèrǎ [sèná<sup>h</sup>] 'pineapples', ʔǎǎ [ʔǎí<sup>h</sup>] 'sugar cane'.

The flap [ɹ] occurs following front oral vowels: kùtíró [kùhtíró<sup>h</sup>] 'chest', dīērì [ndīēí<sup>h</sup>] 'eggs'.

The bilabial stops have an optional rounding or delayed opening of lip closure before /i/.

4. Vowels. The vowels consist of two series, one of oral vowels and a second of the same vowels plus the phoneme of nasalization (see 5.3). The front vowels are voiced high close front unrounded /i/ and voiced mid open front unrounded /e/: pìʔí 'basket', pèʔégò 'break up sticks', kǎʔí 'parakeet', péʔēkè 'a native fish dish'.

Central vowels are high close central unrounded /ɨ/ and voiced low open central unrounded /a/: ʔísó 'alligator',

<sup>1</sup>This is generally true; however, a few cases have been observed where only the following vowel is nasalized and the preceding oral vowel has a slightly nasalized offglide. This is the case in the word bérǎǎ 'bee' and when the person plural marker morpheme {-raǎ} (discussed in 8) is suffixed to a stem ending in voiced oral consonant and oral vowel: yàʔgérǎ 'let's chew!'

ʔàhú 'bread made from bitter manioc (plural)', ʔàsá 'we (exclusive)', ʔàhá 'gallineta, a jungle bird'.

Back vowels are voiced high close back rounded /u/ and voiced mid close back rounded /o/: ʔuhú 'pacu fish', ʔohó 'banana', ʔàhú 'bread made from bitter manioc (plural)', ʔèhó 'influenza'.

4.1. Contrasts. Oral vowels are in contrast in analogous environments as indicated in the following examples:

i/e	pìʔí 'loosely woven basket', pèʔéʔè 'I break up sticks',
i/í/u	bìʔí 'mouse', bìʔí 'piranha (fish)', bùʔú 'tucunaré (fish)',
í/a	bìʔí 'piranha (fish)', bàʔáʔà 'I eat',
u/o	ʔuhú 'pacu (fish)', ʔohó 'banana'.

Oral vowels contrast with nasalized vowels:

i/ĩ	wìʔí 'house', wìʔrṓ 'wind',
e/ẽ	ʔèhú 'poison for fish', ʔèhó 'influenza',
í/ĩ	ʔàsó 'alligator', ʔàsá 'we (exclusive)',
a/ã	kàʔí 'brains', kàʔí 'parakeet',
u/ũ	ʔuìbì 'he's afraid', ʔùʔíri 'dirty',
o/õ	ʔòʔáʔà 'I sweep', ʔòʔá 'bone'.

Nasalized vowels are in contrast in analogous environments:

i/ẽ	sĩṓ 'sister-in-law', wẽṓ 'pan-pipe flutes',
í/ĩ/u	bĩsí 'vine', bĩsá 'you (plural)', bũsá 'seed containing red coloring used for painting the face',
í/a	wĩrĩ 'sloth', wĩrã 'Desano, an Indian tribe',
u/õ	ũbú 'beam', èbó 'howler monkey'.

4.2. Variants. The front vowel /e/, normally mid open unrounded [ɛ], has a close variant [e], which occurs

preceding vowels, velar stops, and labial semivowel /w/:  
 pòʔékà [pòʔékà<sup>h</sup>] 'winter', sêi [sêi<sup>h</sup>] 'gray wooly monkey',  
 kàpèà [kàhpèà<sup>h</sup>] 'eye', pòèwà [pòèwà<sup>h</sup>] 'rapids', wèhékè  
 [wèhékè<sup>h</sup>] 'fish net', wéç [wéç<sup>h</sup>] 'panpipe flutes', ʔèʔkèà  
 [ʔèʔkèà<sup>h</sup>] 'nose'.

The high back rounded vowel has a range of variation from the high close position to mid close position. This range of variation is symbolized by /u/.

The mid back rounded vowel has a range of variation from the mid close position to low close position. This range of variation is symbolized by /o/.

Vowels in syllables with low pitch have a fortis voiceless offglide when they occur preceding a stressed syllable with voiceless consonant onset. Vowels have lenis voiceless offglide breath group finally.

5. Suprasegmental phonemes. Suprasegmental features are stress, pitch, and nasalization.

5.1. Stress. All monosyllabic words are stressed: kí 'bitter manioc', tá 'grass'. Multiple stress occurs: (1) on two-syllable words, (2) on the two principal pitch pattern classes of three-syllable words, and (3) on various other three-syllable words. Stress is marked /' / on words that do not have multiple stress. púrí 'leaf', diá 'river', pátu 'coca', bípírì 'slats', síríá 'Siriano, an Indian tribe'. On two-syllable words and three-syllable words of multiple stress there is a crescendo from the first syllable to the ultimate: <bùpūwí 'blowgun', <yábá 'deer'. Words of four or more syllables crescendo to the second or third syllable and then decrescendo: <ù'búsēʔrò 'fingernail', <kàpē'wérì 'eyebrow'.

5.2. Pitch. The three significant pitch levels are:

high, marked /´/, mid, marked /-/, low, marked /˘/. Monosyllabic words occur on /´/ level: kɛ́ 'he', bú 'guara (jungle rodent). Words of two syllables occur in three pitch patterns: ´´, ´˘, ˘˘. díbá 'poison', díbà 'they are', sèrǎ 'pineapples', sèrǎ 'gray wooly monkeys'.

Words of three syllables occur in two principal pitch patterns: ´´´, ´˘˘. wìʔbāgí 'little boy', bùtuá 'termite', àkárò 'box', dāsēi 'Tucano man'. There are seven minor pitch patterns whose membership is limited: ´´´, ´´˘, ´˘˘, ´˘˘, ´˘˘, ´˘˘, ´˘˘. dúbíó 'woman', dúbíó 'little sister (vocative form)', 'díà'kǎ 'straight', 'bó'borò 'butterfly', díbāsà 'rubber hunter', kǎrèʔkè 'chicken', 'pūdǎʔbò 'hammock rope', kú'kúyò 'cocoanut palm'.

Some pitch patterns are perturbed with the addition of certain possessive pronouns: bāʔbìó 'sister', yàʔǎ 'báʔbìó 'my sister', wìʔí 'house', yá wìʔí 'my house'.

The suffix /-a/ 'noun pluralizer' has intrinsic stress and high pitch. When this suffix occurs on a word with ´´ pattern, the pitch perturbs to ´´´: ètòá 'one lulo (jungle fruit)', ètòá 'lulos', dāsēi 'one Tucano man', dāsèá 'Tucanos'.

The suffix /-se/ 'nominalizer' has intrinsic stress and high pitch. When this suffix occurs on a word with ´´ pattern, the pitch perturbs to ´´´: ʔáyúʔù 'it's good', ʔáyúsé 'a pretty thing', ʔòtéʔè 'I'm planting with seeds', ʔótesé 'seeds'.

5.3. Nasalization. Nasalization is a suprasegmental phoneme represented by / / under each nasalized vowel. Generally nasalization carries throughout the entire word. dítí 'charcoal', sūkúá 'small of back', yábì'ákà 'tomorrow'. If the first vowel in a vowel cluster is nasalized, the nasalization carries to the second vowel: wéó 'panpipe flutes', ʔǎʔkǎ'árò 'deep'. Nasalization may sometimes be stopped by voiceless stops or a cluster of ʔC, and is always stopped by

a voiced stop: yàbíkàʔà 'yesterday', ʔtápè 'rock', sà'hátíá 'Come in!', káʔà'dákà 'thin'. There are certain intrinsically nasalized suffixes: -wĩ 'singular of collective items', -pĩhĩ 'long, narrow object': wàʔíwĩ 'one fish', dĩʔpĩhĩ 'machete'. When the suffix -ra 'person plural marker' occurs, nasalization penetrates to the first preceding vowel: piárò 'two objects', piàrà 'two people', pè'ógàwéʔè 'I'm putting', pè'óràwéʔè 'We're putting'.

## 6. Distribution.

6.1. Syllable patterns. A syllable is defined as a unit of potential pitch placement. It may consist of: a consonant followed by a vowel, a single vowel, or a vowel preceded by a consonant and followed by glottal stop.

CV has three phonetic variants. (1) a SLOW syllable (CV·) occurs on one syllable words, on multiple syllable words if the following two syllables are stressed, or if stress and high pitch occur on the same syllable. /dí/ [ndí·h] 'blood', /págà/ [pá·gàh] 'stomach', /dúbíó/ [nú·míó<sup>h</sup>] 'woman'; (2) voiceless consonant onset plus simple vowel peak with low pitch plus voiceless offglide (CVh). (CVh) occurs preceding a stressed syllable with voiceless consonant onset. /pèká/ [pèhká<sup>h</sup>] 'firewood', /bì'ápì'tèrò/ [mbì'ápìh'tèñò<sup>h</sup>] 'guitar'; (3) a FAST syllable (CV) occurs phonemic word initial, medial, or final. /dì'ápōa/ [ndì'ápōa<sup>h</sup>] 'face', /dúbíó/ [nú·míó<sup>h</sup>] 'woman', /wádārì/ [wá·dālì<sup>h</sup>] 'veins'.

V occurs phonemic word medial or final following a vowel: /dìá'kí/ 'straight', /dìá/ 'river'.

CVʔ occurs phonemic word initial or medial, preceding consonants: /yà'pí/ 'slick', /'pūdíʔ'bò/ 'hammock rope'.

6.2. Single consonants. Any consonant may occur as C in the CV syllable: ʔòʔá'rí'bōkà 'broom', págà 'stomach',

díáyì 'dog', púgɛ́ 'hammock', wètá 'tapioca', sèbéyá 'Paca River', dùhá 'ash'.

Any consonant may occur as C of CV? syllable except g, h, r: pì?ká 'guaituto (jungle fruit)', tù?tísé 'scold', kà?bí 'soft', bù?bésé 'injection', dì?tá 'earth', yà?bú 'yam', sà?tísé 'cough', wì?bɛ́ 'little boy', yà?pí 'slick', ?à?tó 'here'.

6.3. Consonant clusters. Phonemic word medial CC clusters occur across syllable boundaries with the first member always glottal stop. The second member may be a voiceless stop, voiced bilabial stop, voiceless alveolar grooved fricative, or alveolar flap. yà?pí 'slick', ?à?tó 'here', pì?ká 'guaituto (jungle fruit)', kà?bí 'soft', ?è?sāró 'wide', bè?ró 'afterwards'.

6.4. Single vowels. Any vowel may occur as nucleus in CV and CV? syllables: pì?ká 'guaituto (jungle fruit)', kà?bí 'soft', pò?pēápè 'inside', ?è?sāró 'wide', pù?tí 'mass of grated manioc root', dɛ́?pókà 'leg', dɛ́?kórì 'root', bù?būsé 'full', ?è?kēá 'nose', dì?kɛ́ 'one (man)', kũ'kúyò 'cocoanut palm', sò?pɛ́ 'there', bà?bá 'new'.

All oral vowels, and ɔ and ɔ occur in the V syllable: sêl 'black wooly monkey', diērí 'eggs', díá 'river', sãurú 'Saturday', dòá 'who', wéó 'panpipe flutes', ă 'good!', bîkô 'old woman'.

6.5. Vowel clusters. Clusters of two oral vowels occur across syllable boundaries word medial or final when a CV syllable is followed by a V syllable. Any vowel may occur either initial or final in a cluster; not all potential combinations have been found to date. diākɛ́ 'straight', dàsêo 'Tucano woman', yâi 'tiger', bîkô 'old woman'. ð and u have been found only after a: ă 'good!', sãurú 'Saturday'.

Clusters of two nasalized vowels occur across syllable

boundaries word medial or final when a CV syllable is followed by a V syllable. The first vowel of the cluster may be any vowel and the second vowel is always a or o: yábi'ákà 'tomorrow', síŋ 'sister-in-law', ʔèŋrò 'mirror', ʔèʔkéá 'nose', tʔòwá 'second rapids below village of Acaricuara', sùkúá 'small of back', bòárà 'flies', ʔbìá 'men'.

Clusters of three vowels may occur word medial across syllable boundaries. The clusters thus far encountered are: iao, oea, eoa, aia. diáo'tíkàʔrò 'water boa', kōè'ápì 'I washed', pēò'ápì 'I put', yáíá 'tigers'.

Clusters of four vowels may occur word medial across syllable boundaries. The only cluster thus far encountered is: aiaa. ñáííá'pá 'it dried'.

For clusters of oral plus nasalized vowel see 5.3.

## 7. Observations on special phonetic characteristics.

7.1. Laryngealization. Laryngealization may occur on vowels preceding ʔ or separated by ʔ: ʔòʔbé [ʔòʔmé<sup>h</sup>] 'smoke', bùʔédà [m̃buʔédà<sup>h</sup>] 'rainbow', píʔí [píʔí<sup>h</sup>] 'basket', ʔòʔá [ʔòʔá<sup>h</sup>] 'bone'.

7.2. Devoicing. Voiced vowels have freely fluctuating voiceless variants in the following situations: (1) in (CVh) patterns with voiceless consonant onset preceding a voiceless consonant: pèkábè [pèhkámè<sup>h</sup>] 'fire', sìkó [sìhkó<sup>h</sup>] 'that one (feminine)', ʔáké [ʔÀhké<sup>h</sup>] 'monkey'; (2) when a CV syllable with voiceless consonant onset precedes hV which has higher pitch: pàhīgó [pÀhīgó<sup>h</sup>] 'fat woman', ʔòhókà [ʔÒhókà<sup>h</sup>] 'corn', sàháyà [sÀháyà<sup>h</sup>] 'Go in!'

7.3. Vowel release. Following h word medially there occurs a release having the quality of the preceding vowel: ʔèhábi [ʔèh<sup>e</sup>ámì<sup>h</sup>] 'he came', wiháʔà [wìh<sup>i</sup>áʔà<sup>h</sup>] 'I'm leaving', ʔò'hágàwēʔé [ʔò'h<sup>o</sup>ágàwēʔé<sup>h</sup>] 'I'm writing'.

Preceding consonants, the glottal stop has an optional

vocalic release of a neutral quality or of the quality of the preceding vowel. This varies from slight release before voiceless stops to a slightly more perceptible release before voiced consonants, especially flaps. wìʔrò [wìʔi̯nòʰ] 'wind', bùʔbéʔè [mbùʔu̯béʔèʰ] 'I'm planting by sticking in the ground'.

7.4. Optional shifts of pronunciation. There are optional shifts of pronunciation from /k/ to /h/ in certain words. These occur in conversational style. /k/ is regarded by native speakers as the correct form. dìʔkāká [nìʔkākáʰ ~ nìʔkāhāʰ] 'today', yìʔ kēʔrà [yìʔ kēʔnāʰ ~ yìʔ hēʔnāʰ] 'I, also', yábìʔákà [yámìʔákàʰ ~ yámìʔáhāʰ] 'tomorrow'.

There are optional shifts of pronunciation from [m] to [b] in certain words, with a corresponding shift from nasalized vowel to oral vowel. These occur in emphatic speech. [m] is regarded as the correct form. díkàbíʔì [níkàmíʔìʰ ~ níkàmbíʔìʰ] 'I am here', bùhíkàʔbò [mbùhíkàʔmòʰ ~ mbùhíkàʔbòʰ] 'she herself laughed'.

There are optional shifts of pronunciation from /e/ to /i/ in certain words. The syllable in which the change occurs perturbs to an exaggerated high pitch with heavy stress. These occur in emphatic speech style. /e/ is regarded as the correct form. wàʔáràwēʔè [wàʔáñàwēʔèʰ ~ wàʔáñàʔwìʰ] 'We're going.'

There are optional shifts of pronunciation from /a/ and /a/ to /i/ in certain words. The syllable in which the change occurs perturbs to an exaggerated high pitch. If [ñ], [m], or [y] precede the vowel, the nasal variant shifts to the oral variant at the corresponding point of articulation. These occur in emphatic speech style. The nasal variant is regarded as the correct form. wàʔárà [wàʔáñàʰ ~ wàʔáʔíʰ] 'Let's go!', ʔìʔábà [ʔìʔámàʰ ~ ʔìʔámʔbíʰ] 'Let me see!'

dùhíkàʔà [ndùhíkàʔà<sup>h</sup> ~ ndùhí'kí<sup>h</sup>] 'I'm sitting!', wàhāyá [wàhāyá<sup>h</sup> ~ wàhā'yá<sup>h</sup>] 'paddle!', ʔìʔáyà [ʔìʔáyà<sup>h</sup> ~ ʔìʔā'yá<sup>h</sup>].

8. Morphophonemic alternation. The morphemes {-gi} 'singular person marker (masculine)' or {-go} 'singular person marker (feminine)' have two allomorphs: (1) suffixed to a verb root ending in an oral vowel, /-gi/ or /-go/ occur; (2) suffixed to a verb root ending in a nasalized vowel /-gi/ or /-go/ occur. ʔìʔágíwēʔè 'I'm looking (masculine)', wāʔāgówēʔè 'I'm going (feminine)'.

The morpheme {-ya} 'simple imperative' has three allomorphs: (1) suffixed to a verb root ending in an oral vowel, /-ya/ occurs; (2) suffixed to a verb root ending in a nasalized vowel, /-ya/ occurs, (3) suffixed to a verb root ending in /-ti-/, /-a/ occurs. bùʔbéyà 'plant by sticking in the ground!', kārìyá 'sleep!', ʔāʔtiá 'come!'

When the morpheme /-wi/ 'first person, distant past' is suffixed to a verb root ending in a nasalized vowel, /-wi/ occurs. ʔìʔáwá 'I saw'.

When the morpheme /-a/ 'a pluralizer' is suffixed to a word ending in a nasalized vowel, /-a/ occurs. ʔbàá 'men', sēbēá 'pacas (jungle animal)'.

For alternation of oral vowel preceding morpheme /-ra/ 'person plural marker', see 5.3.

9. Higher level units. Phonemic words are made up of syllables. The full potential for the number of syllables to a word has not yet been explored, but as many as eight have been observed. tá 'grass', ʔakárò 'box', ʔòmasìsìrìsāʔà 'I want to understand'.

A string of one or more phonemic words constitutes a breath group. In this larger unit there is crescendo followed by decrescendo.

dôʔó wāʔatī 'Where are you going?', ʔāʔtòré bārìbí 'He isn't here'.

Waterhouse, Viola G., editor. 1967. *Phonemic systems of Colombian languages*. Summer Institute of Linguistics Publications in Linguistics and Related Fields, 14. Norman: Summer Institute of Linguistics of the University of Oklahoma. 98 p.